AMENDMENTS TO THE CLAIMS

1. (Original) A dispensing assembly for sample liquid droplets of less than 5 µl in volume comprising:-

a dispenser body having a main bore;

a nozzle mounted on the dispenser body and terminating in a dispensing tip, the nozzle having a nozzle bore with a nozzle entrance communicating with the main bore;

a divider barrier for separating system and sample liquid within the assembly, the divider barrier comprising a body of elastomeric substantially incompressible material; and

a positive displacement pump for delivery of metered quantities of system liquid through the assembly to displace the barrier to deliver sample liquid through the nozzle bore.

2. (Original) A dispensing assembly as claimed in claim 1 comprising;

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

3. (Original) A dispensing assembly as claimed in claim 1 comprising;

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode positioned below the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

4. (Original) A dispensing assembly as claimed in claim 1 comprising:-

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip ;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

a droplet receiving substrate mounted between the receiving electrode and the dispensing tip.

5. (Original) A dispensing assembly as claimed in claim 1 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip including a hole for the passage of a droplet therethrough;
a droplet receiving substrate mounted below the receiving electrode; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

6. (Original) dispensing assembly as claimed in claim 1 comprising;

an electrode electrically coupled to the dispensing tip;

a plurality of separate receiving electrodes remote from the tip each having a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted below the receiving electrodes;

means for activating the receiving electrodes separately; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

7. (Original) A dispensing assembly as claimed in claim 1 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip;

a droplet receiving substrate mounted above the receiving electrode;
a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

synchronous indexing means for the dispenser and the receiving electrode for accurate deployment of droplets on the substrate.

8. (Original) A dispensing assembly as claimed in claim 1 comprising;

an electrode electrically coupled to the dispensing tip ;

a plurality of separate receiving electrodes forming droplet deflection electrodes remote from the tip;

a droplet receiving substrate mounted above the deflection electrodes;

a high voltage generating means connected to at least one of the deflection electrodes to provide an electrostatic field between them and the tip; and

control means to vary the voltage applied to the deflection electrodes.

9. (Original) A dispensing assembly as claimed in claim 1, comprising:-

a compression wave generator; and

a controller having means to actuate the generator to cause a wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

10. (Original) A dispensing assembly as claimed in claim 1, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

11. (Original) A dispensing assembly as claimed in claim 1, in which the positive displacement pump comprises an assembly of at least two pumps installed in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump.

12. (Original) A dispensing assembly as claimed in claim 1, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir portion and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two portions together;

a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

13. (Original) A dispensing assembly as claimed in claim 1, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for releasably connecting the two portions together;

a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

14. (Original) A dispensing assembly as claimed in claim 1, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the dimensions of the divider barrier and the main bore being such as to fit closely in the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

15. (Original) A dispensing assembly as claimed in claim 1, in which the dispenser body comprises:-

an inner part having a system liquid reservoir forming some of the main bore;

a nozzle mounting part having a sample liquid reservoir forming the remainder of the main bore;

a divider barrier comprising at least two closely contacting members at least one member being secured to each of the parts.

16. (Original) A dispensing assembly as claimed in claim 1, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

17. (Original) A dispensing assembly as claimed in claim 1, in which the dispenser body comprises a two part body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir forming the main bore, means for mounting the divider barrier between the two parts and means for connecting the two portions together.

18. (Original) A dispensing assembly as claimed in claim 1, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause a wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

19. (Original) A dispensing assembly as claimed in claim 1, comprising:-

a piezoactuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the piezoactuator to cause the compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

20. (Original) A dispensing assembly as claimed in claim 1, comprising:-

a magnetostrictive actuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the magnetostrictive actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

21. (Original) A dispensing assembly as claimed in claim 1 comprising a magnetostatic actuator including a magnetic core and a magnetic coil coupled together for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid and a controller having means to operate the magnetostatic actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

22. (Original) A dispensing assembly as claimed in claim 1, in which the divider barrier is housed in the main bore dividing it into a system liquid reservoir and a sample liquid reservoir and the shape of the divider barrier and the main bore being such

that substantially all the sample liquid can be expelled by means of the positive displacement pump.

23. (Original) A dispensing assembly as claimed in claim 1, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir and the divider barrier is pre-stretched.

24. (Original) A dispensing assembly as claimed in claim 22, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties and the divider barrier is pre-stretched.

25. (Original) A dispensing assembly as claimed in claim 22, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause the compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

26. (Original) A dispensing assembly as claimed in claim 22, comprising:-

a piezoactuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the piezoactuator to cause the compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

27. (Original) A dispensing assembly as claimed in claim 22, comprising:-

a magnetostrictive actuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the magnetostrictive actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

28. (Original) A dispensing assembly as claimed in claim 22, in which the nozzle mounting part and divider barrier form the one sealed sub-assembly.

29. (Original) A dispensing assembly as claimed in claim 22, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates

portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

30. (Original) A dispensing assembly as claimed in claim 1, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

31. (Original) A dispensing assembly as claimed in claim 30 comprising;

an electrode electrically coupled to each dispensing tip;

a separate receiving electrode below each tip; and

a high voltage generating means connected to at least one of each of the pairs of electrodes to provide an electrostatic field between each tip and corresponding receiving electrodes.

32. (Original) A dispensing assembly as claimed in claim 30 comprising:-

an electrode electrically coupled to each dispensing tip;

a separate receiving electrode for each of the tips remote from each tip;

a high voltage generating means connected to at least one of each of the pairs of electrodes to provide an electrostatic field between each tip and corresponding receiving electrodes; and

a droplet receiving substrate mounted between the receiving electrodes and the dispensing tips.

33. (Original) A dispensing assembly as claimed in claim 30 comprising;

an electrode electrically coupled to each dispensing tip ;

a separate receiving electrode for each of the tips remote from each tip including a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted below the receiving electrodes; and

a high voltage generating means connected to at least one of each of the pair of electrodes to provide an electrostatic field between each tip and corresponding receiving electrodes.

34. (Original) A dispensing assembly as claimed in claim 30 comprising;

an electrode electrically coupled to each dispensing tip ;

a separate receiving electrode for each of the tips remote from the tip;

a droplet receiving substrate mounted below the receiving electrode;

a high voltage generating means connected to at least one of either the electrodes in each tip or the receiving electrode to provide an electrostatic field therebetween; and

synchronous indexing means for the dispenser and the receiving electrode for accurate deployment of droplets on the substrate.

35. (Original) A dispensing assembly as claimed in claim 30 comprising;

an electrode electrically coupled to each dispensing tip ;

a plurality of separate receiving electrodes forming droplet deflection electrodes remote from the tips;

a droplet receiving substrate mounted below the deflection electrodes;

a high voltage generating means connected to at least one of the deflection electrodes to provide an electrostatic field therebetween; and

control means to vary the voltage applied to the deflection electrodes.

36. (Original) A dispensing assembly as claimed in claim 30, in which the positive displacement pump comprises an assembly of at least two pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump.

at least two positive displacement pumps, one pump having a working stroke displacing a volume about at least ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts; and

means for connecting the two parts together.

38. (Original) A dispensing assembly as claimed in claim 30, comprising:-

at least two positive displacement pumps, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

37. (Original) A dispensing assembly as claimed in claim 30, comprising:-

at least two positive displacement pumps, one pump having a working stroke displacing a volume about at least ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts; and

means for connecting the two parts together.

38. (Original) A dispensing assembly as claimed in claim 30, comprising:-

at least two positive displacement pumps, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

and in which the dimensions of the divider barrier and the main bore are such as to fit closely in the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

39. (Original) A dispensing assembly as claimed in claim 30, in which the divider barrier comprises at least two closely contacting members at least one member being secured to each of the parts.

40. (Original) A dispensing assembly as claimed in claim 30, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

41. (Original) A dispensing assembly as claimed in claim 1, in which the dispenser body houses the divider barrier therein and the dimensions of the divider barrier and the main bore are such that the system liquid can cause the divider barrier to lie against all of the main bore between the barrier and the nozzle entrance thus expelling essentially all the sample liquid.

42. (Original) A dispensing assembly as claimed in claim 41, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause the compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

43. (Original) A dispensing assembly as claimed in claim 41, comprising:-

a piezoactuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the piezoactuator to cause the compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

44. (Original) A dispensing assembly as claimed in claim 41, comprising:-

a magnetostrictive actuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the magnetostrictive actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

45. (Original) A dispensing assembly as claimed in claim 41 comprising a magnetostatic actuator including a magnetic core and a magnetic coil coupled together for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid and a controller having means to operate the magnetostatic actuator to cause

a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

46. (Original) A dispensing assembly as claimed in claim 41, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

47. (Original) A dispensing assembly as claimed in claim 41, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

48. (Original) A dispensing assembly as claimed in claim 41 comprising;

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode below the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

49. (Original) A dispensing assembly as claimed in claim 41 comprising:-

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip ;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

a droplet receiving substrate mounted between the receiving electrode and the dispensing tip.

50. (Original) A dispensing assembly as claimed in claim 41 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip including a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted below the receiving electrode; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

51. (Original) A dispensing assembly as claimed in claim 41 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip;

a droplet receiving substrate mounted above the receiving electrode;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

synchronous indexing means for the dispenser and the receiving electrode for accurate deployment of droplets on the substrate.

52. (Original) A dispensing assembly as claimed in claim 41 comprising;

an electrode electrically coupled to the dispensing tip;

a plurality of separate receiving electrodes and droplet deflection electrodes remote from the tip;

a droplet receiving substrate mounted above some of the electrodes;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

control means to vary the voltage applied to the deflection and receiving electrodes.

53. (Original) A dispensing assembly as claimed in claim 41, in which the positive displacement pump comprises an assembly of at least two pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump.

54. (Original) A dispensing assembly as claimed in claim 41, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

55. (Original) A dispensing assembly as claimed in claim 41, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

56. (Original) A dispensing assembly as claimed in claim 41, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the dimensions of the divider barrier and the main bore being such as to fit closely in the sample liquid reservoir and across and against the nozzle entrance for each of the nozzles under the influence of the system liquid.

57. (Original) A dispensing assembly as claimed in claim 41, in which the divider body comprises at least two closely contacting members at least one member being secured to each of the parts.

58. (Original) A dispensing assembly as claimed in claim 41, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

59. (Original) A dispensing assembly as claimed in claim 1, in which the dispenser body comprises:-

an inner part having a system liquid reservoir forming some of the main bore;

a nozzle mounting part having a sample liquid reservoir forming the rest of the main bore; and

means for releasably connecting the two parts together with the divider barrier sandwiched therebetween, the dimensions of the divider barrier and the main bore being such as to fit closely together in the sample liquid

reservoir and across and against the nozzle entrance under the influence of the system liquid.

60. (Original) A dispensing assembly as claimed in claim 59, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

61. (Original) A dispensing assembly as claimed in claim 59, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

62. (Original) A dispensing assembly as claimed in claim 59, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

63. (Original) A dispensing assembly as claimed in claim 1, in which the dispenser body comprises:-

an inner part having a system liquid reservoir forming some of the main bore;

a nozzle mounting part having a sample liquid reservoir forming the remainder of the main bore, the sample liquid reservoir adjacent the nozzle entrance being concave;

means for connecting the two parts together with the divider barrier sandwiched therebetween, the dimensions of the divider barrier and the main bore being such as to fit closely together in the main bore of the sample liquid reservoir and across and adjacent the nozzle entrance under the influence of the system liquid.

64. (Original) A dispensing assembly as claimed in claim 63, in which the mounting part, divider barrier and nozzle form the one sealed sub-assembly.

65. (Original) A dispensing assembly as claimed in claim 63, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

66. (Original) A dispensing assembly as claimed in claim 63, comprising:-

a piezoactuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the piezoactuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

67. (Original) A dispensing assembly as claimed in claim 63, comprising:-

a magnetostrictive actuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the magnetostrictive actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

68. (Original) A dispensing assembly as claimed in claim 63 comprising a magnetostatic actuator including a magnetic core and a magnetic coil coupled together for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid and a controller having means

to operate the magnetostatic actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

69. (Original) A dispensing assembly as claimed in claim 63 comprising:-

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

70. (Original) A dispensing assembly as claimed in claim 63, comprising:-

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

a droplet receiving substrate mounted between the receiving electrode and the dispensing tip.

71. (Original) A dispensing assembly as claimed in claim 63, comprising:-

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip including a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted between the receiving electrode; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

72. (Original) A dispensing assembly as claimed in claim 63, comprising:-

an electrode electrically coupled to the dispensing tip;

a plurality of separate receiving electrodes remote from the tip each having a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted between the receiving electrodes;

means for activating the receiving electrodes separately; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

73. (Original) A dispensing assembly as claimed in claim 63, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir and the divider barrier is pre-stretched.

74. (Original) A dispensing assembly as claimed in claim 63 comprising;

an electrode electrically coupled to the dispensing tip ;

a plurality of separate receiving electrodes and droplet deflection electrodes remote from the tip;

a droplet receiving substrate mounted below the deflection electrodes;

a high voltage generating means connected to at least one of the deflection electrodes and at lest one of the receiving electrodes to provide an electrostatic field therebetween; and

control means to vary the voltage applied to the deflection electrodes.

75. (Original) A dispensing assembly as claimed in claim 63, in which the positive displacement pump comprises an assembly of at least two pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump.

76. (Original) A dispensing assembly as claimed in claim 63, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

77. (Original) A dispensing assembly as claimed in claim 63, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

78. (Original) A dispensing assembly as claimed in claim 63, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the dimensions of the divider barrier and the main bore being such as to fit closely in the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

79. (Original) A dispensing assembly as claimed in claim 63, in which the divider barrier comprises at least two closely contacting members at least one member being secured to each of the parts.

80. (Original) A dispensing assembly as claimed in claim 63, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

81. (Original) A dispensing assembly as claimed in claim 1, in which the dispenser body comprises:-

an inner part having a system liquid reservoir forming some of the main bore;

a nozzle mounting part having a sample liquid reservoir forming the remainder of the main bore;

a divider barrier comprising a pair of closely contacting members, one member secured to the inner part and the other member to the nozzle mounting part; and

means for releasably connecting the parts together.

82. (Original) A dispensing assembly as claimed in claim 81, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

83. (Original) A dispensing assembly as claimed in claim 81, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

84. (Original) A dispensing assembly as claimed in claim 81, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers together forming at least two sets of divider barriers, each set having different elastomeric properties.

85. (Original) A dispensing assembly as claimed in claim 81 in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle to form separate sample liquid

reservoirs divided from the one system liquid reservoir by individual barriers, the assembly comprising:-

an electrode electrically coupled to each of the dispensing tips;

a separate receiving electrode below each tip; and

a high voltage generating means connected to at least some of the electrodes to provide an electrostatic field therebetween.

86. (Original) A dispensing assembly as claimed in claim 81, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual barriers, the assembly comprising:-

an electrode electrically coupled to each of the dispensing tips;

separate receiving electrodes remote from the tips;

a high voltage generating means connected to at least some of the electrodes to provide an electrostatic field therebetween; and

a droplet receiving substrate mounted between the receiving electrodes and the dispensing tips.

87. (Original) A dispensing assembly as claimed in claim 81 in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle to form separate sample liquid

reservoirs divided from the one system liquid reservoir by individual barriers, the assembly comprising:-

an electrode electrically coupled to each of the dispensing tips;

a separate receiving electrode remote from each of the tips;

a droplet receiving substrate mounted above the receiving electrodes;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

synchronous indexing means for the dispenser and the receiving electrodes for accurate deployment of droplets on the substrate.

88. (Original) A dispensing assembly as claimed in claim 81 in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual barriers, the assembly comprising:-

an electrode electrically coupled to each of the dispensing tips;

a plurality of separate receiving electrodes and droplet deflection electrodes remote from the tip;

a droplet receiving substrate mounted below the deflection electrodes;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

control means to vary the voltage applied to the deflection electrodes.

89. (Original) A dispensing assembly as claimed in claim 81, in which the positive displacement pump comprises an assembly of at least two pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump.

90. (Original) A dispensing assembly as claimed in claim 81, comprising at least two positive displacement pumps, one pump having a working stroke displacing a volume about at least ten times larger than that of the other pump, the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

91. (Original) A dispensing assembly as claimed in claim 81, comprising at least two positive displacement pumps, one pump having a working stroke displacing a volume about at least ten times larger than that of the other pump, the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

92. (Original) A dispensing assembly as claimed in claim 81, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

93. (Original) A dispensing assembly as claimed in claim 1, in which the divider barrier is formed from a separate sample liquid container mounted in the dispenser body and connected directly to the nozzle entrance.

94. (Original) A dispensing assembly as claimed in claim 93, in which the dispenser body mounts a plurality of nozzles and a separate sample liquid container is connected to each nozzle.

95. (Original) A dispensing assembly as claimed in claim 93, in which the dispenser body mounts a plurality of nozzles and a separate sample liquid container is connected to each nozzle, the liquid containers being so formed that there are at least two sets of individual divider barriers having different elastomeric properties.

96. (Original) A dispensing assembly as claimed in claim 93, in which the sample liquid container and nozzle form the one sub-assembly releasably connected to the dispenser body.

97. (Original) A dispensing assembly as claimed in claim 1, in which the divider barrier is formed from a separate sample liquid container mounted in the dispenser body and the external dimensions of the divider barrier and the main bore are such that the container can collapse on displacement in the main bore to lie across and against the nozzle entrance.

98. (Original) A dispensing assembly as claimed in claim 97, in which the dispenser body mounts a plurality of nozzles and a separate sample liquid container is connected to each nozzle.

99. (Original) A dispensing assembly as claimed in claim 97, in which the dispenser body mounts a plurality of nozzles and a separate sample liquid container is connected to each nozzle, the liquid containers being so formed that there are at least two sets of individual divider barriers having different elastomeric properties.

100. (Original) A dispensing assembly as claimed in claim 97 in which the dispenser body mounts a plurality of separate nozzles and a separate liquid container is connected to each nozzle, the assembly comprising:-

an electrode electrically coupled to each dispensing tip;

a separate receiving electrode below each tip; and

a high voltage generating means connected to at least one of the pairs of electrodes to provide an electrostatic field therebetween.

101. (Original) A dispensing assembly as claimed in claim 97 in which the dispenser body mounts a plurality of separate nozzles and a separate liquid container is connected to each nozzle, the assembly comprising:-

an electrode electrically coupled to each dispensing tip;

a separate receiving electrode remote from each tip;

a high voltage generating means connected to at least one of the pairs of electrodes to provide an electrostatic field therebetween; and

a droplet receiving substrate mounted between the receiving electrode and the dispensing tips.

102. (Original) A dispensing assembly as claimed in claim 97 in which the dispenser body mounts a plurality of separate nozzles and a separate liquid container is connected to each nozzle, the assembly comprising:-

an electrode electrically coupled to each dispensing tip ;

a separate receiving electrode remote from each tip including a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted above the receiving electrodes; and

a high voltage generating means connected to at least one of the pair of electrodes to provide an electrostatic field therebetween.

103. (Original) A dispensing assembly as claimed in claim 97 in which the dispenser body mounts a plurality of separate nozzles and a separate liquid container is connected to each nozzle, the assembly comprising:-

an electrode electrically coupled to each dispensing tip ;

a separate receiving electrode remote from the tips;

a droplet receiving substrate mounted above the receiving electrode;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

synchronous indexing means for the dispenser and the receiving electrode for accurate deployment of droplets on the substrate.

104. (Original) A dispensing assembly as claimed in claim 97 in which the dispenser body mounts a plurality of separate nozzles and a separate liquid container is connected to each nozzle, the assembly comprising:-

an electrode electrically coupled to each dispensing tip ;

a plurality of separate receiving electrodes and droplet deflection electrodes remote from the tip;

a droplet receiving substrate mounted below the deflection electrodes;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

control means to vary the voltage applied to the electrodes.

105. (Original) A dispensing assembly as claimed in claim 97, in which the positive displacement pump comprises an assembly of at least two pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump.

106. (Original) A dispensing assembly as claimed in claim 97, comprising:-

at least two positive displacement pumps connected in parallel, tne pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;
means for connecting the two parts together;
a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

107. (Original) A dispensing assembly as claimed in claim 97, comprising at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume about at least ten times larger than that of the other pump, the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

108. (Original) A dispensing assembly as claimed in claim 97, comprising at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume about at least ten times larger than that of the other pump, the dispenser body mounts a plurality of nozzles and a separate sample liquid container is connected to each nozzle, the liquid containers being so formed such that there are at least two sets of individual divider barriers having different elastomeric properties.

109. (Original) A dispensing assembly as claimed in claim 97, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

110. (Original) A dispensing assembly for sample liquid droplets of less than 5 µl in volume comprising:-

a dispenser body having a main bore;

a divider barrier for separating the main bore into a system liquid reservoir and a sample liquid reservoir and comprising a body of elastomeric substantially incompressible material;

a nozzle mounted on the dispenser body and terminating in a dispensing tip, the nozzle having a nozzle bore with a nozzle entrance communicating with the sample liquid reservoir; and

a positive displacement pump for delivery of metered quantities of system liquid through the assembly to cause the divider barrier to move into and out of the sample liquid reservoir.

111. (Original) A dispensing assembly as claimed in claim 110, in which the dispenser body is a two part body such that the sample liquid reservoir, divider barrier and nozzle form the one sealed sub-assembly.

112. (Original) A dispensing assembly as claimed in claim 110, in which the dimensions of the divider barrier and the main bore are such that the system liquid can cause the divider barrier to lie against all of the main bore between the barrier and the nozzle entrance.

113. (Original) A dispensing assembly as claimed in claim 110, in which the dispenser body comprises a two part body housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore with the divider barrier sandwiched therebetween, the external shape of the divider barrier being such as to fit closely in the main bore of the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

114. (Original) A dispensing assembly as claimed in claim 110, in which the external dimensions of the barrier and the main bore are such as to fit closely together in the main bore of the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

115. (Original) A dispensing assembly as claimed in claim 110, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause the compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

116. (Original) A dispensing assembly as claimed in claim 110, comprising:-

a piezoactuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing the compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the piezoactuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

117. (Original) A dispensing assembly as claimed in claim 110, comprising:-

a magnetostrictive actuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the magnetostrictive actuator to cause the compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

118. (Original) A dispensing assembly as claimed in claim 110 comprising a magnetostatic actuator including a magnetic core and a magnetic coil coupled together for

causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid and a controller having means to operate the magnetostatic actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

119. (Original) A dispensing assembly as claimed in claim 110, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

120. (Original) A dispensing assembly as claimed in claim 110, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

121. (Original) A dispensing assembly as claimed in claim 110 comprising;

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode below the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

122. (Original) A dispensing assembly as claimed in claim 110 comprising:-

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip ;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

a droplet receiving substrate mounted between the receiving electrode and the dispensing tip.

123. (Original) A dispensing assembly as claimed in claim 110 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip including a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted below the receiving electrode; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

124. (Original) A dispensing assembly as claimed in claim 110 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip;

a droplet receiving substrate mounted above the receiving electrode;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

synchronous indexing means for the dispenser and the receiving electrode for accurate deployment of droplets on the substrate.

125. (Original) A dispensing assembly as claimed in claim 110 comprising;

an electrode electrically coupled to the dispensing tip ;

a plurality of separate receiving electrodes and droplet deflection electrodes remote from the tip;

a droplet receiving substrate mounted above at least some of the electrodes;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

control means to vary the voltage applied to the deflection electrodes.

126. (Original) A dispensing assembly as claimed in claim 110, in which the positive displacement pump comprises an assembly of at least two pumps connected in

parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump.

127. (Original) A dispensing assembly as claimed in claim 110, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

128. (Original) A dispensing assembly as claimed in claim 110, comprising:-

at least two positive displacement pumps connected in parallel, ne pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the divider barrier additionally separating portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

129. (Original) A dispensing assembly as claimed in claim 110, comprising:-

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump;

a two part body forming the dispenser body, namely an inner part and a nozzle mounting part, housing respectively a system liquid reservoir and a sample liquid reservoir together forming the main bore;

means for mounting the divider barrier between the two parts;

means for connecting the two parts together;

a plurality of nozzles in the mounting part; and

the dimensions of the divider barrier and the main bore being such as to fit closely in the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

130. (Original) A dispensing assembly as claimed in claim 110, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

131. (Original) A dispensing assembly for sample liquid droplets of less than 5 µl in volume comprising:-

a dispenser body comprising a two-part dispenser body connected together and having a main bore;

a divider barrier for separating the main bore into a system liquid reservoir and a sample liquid reservoir and comprising a body of elastomeric substantially incompressible material;

a nozzle mounted on the dispenser body and terminating in a dispensing tip, the nozzle having a nozzle bore with a nozzle entrance communicating with the sample liquid reservoir;

a positive displacement pump for delivery of metered quantities of system liquid through the assembly to cause the divider barrier move into and out of the sample liquid reservoir.

132. (Original) A dispensing assembly as claimed in claim 131, in which the sample liquid reservoir, divider barrier and nozzle form the one sealed sub-assembly.

133. (Original) A dispensing assembly as claimed in claim 131, in which the dimensions of the divider barrier are such that the system liquid can cause the divider barrier to lie against all of the main bore between the barrier and the nozzle entrance.

134. (Original) A dispensing assembly as claimed in claim 131, in which the dispenser body comprises a connector for releasably joining the two portions together with the divider barrier sandwiched therebetween, the dimensions of the divider barrier and the main bore being such as to fit closely together in the main bore of the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

135. (Original) A dispensing assembly as claimed in claim 131, in which the dimensions of the barrier and the main bore are such as to fit closely together in the main bore of the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

136. (Original) A dispensing assembly as claimed in claim 131, in which the divider barrier comprises:-

a pair of closely contacting membranes, one membrane secured to the system liquid reservoir and the other membrane to the sample liquid reservoir, and

means for releasably connecting the portions together.

137. (Original) A dispensing assembly as claimed in claim 131, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

138. (Original) A dispensing assembly as claimed in claim 131, comprising:-

a piezoactuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the piezoactuator to cause the compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

139. (Original) A dispensing assembly as claimed in claim 131, comprising:-

a magnetostrictive actuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing the compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the magnetostrictive actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

140. (Original) A dispensing assembly as claimed in claim 131 comprising a magnetostatic actuator including a magnetic core and a magnetic coil coupled together for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid and a controller having means to operate the magnetostatic actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

141. (Original) A dispensing assembly as claimed in claim 131, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

142. (Original) A dispensing assembly as claimed in claim 131, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

143. (Currently Amended) A ~~divider barrier~~ dispensing assembly as claimed in claim 131, in which the divider barrier comprises at least two closely contacting members, at least one member being secured to each of the parts.

144. (Original) A dispensing assembly as claimed in claim 131 comprising;

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode below the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

145. (Original) A dispensing assembly as claimed in claim 131 comprising:-

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip ;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

a droplet receiving substrate mounted between the receiving electrode and the dispensing tip.

146. (Original) A dispensing assembly as claimed in claim 131 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip including a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted below the receiving electrode; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

147. (Original) A dispensing assembly as claimed in claim 131 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip;

a droplet receiving substrate mounted above the receiving electrode;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

synchronous indexing means for the dispenser and the receiving electrode for accurate deployment of droplets on the substrate.

148. (Original) A dispensing assembly as claimed in claim 131 comprising;

an electrode electrically coupled to the dispensing tip ;

a plurality of separate receiving electrodes forming droplet deflection electrodes remote from the tip;

a droplet receiving substrate mounted above the deflection electrodes;

a high voltage generating means connected to at least one of the deflection electrodes to provide an electrostatic field therebetween; and

control means to vary the voltage applied to the deflection electrodes.

149. (Original) A dispensing assembly as claimed in claim 131, in which the positive displacement pump comprises an assembly of at least two pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times larger than that of the other pump.

150. (Original) A dispensing assembly as claimed in claim 131, comprising at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume about at least ten times larger than that of the other pump and in which the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

151. (Original) A dispensing assembly as claimed in claim 131, comprising at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume about at least ten times larger than that of the other pump and in which the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir by individual divider barriers, the divider barriers forming at least two sets of divider barriers, each set having different elastomeric properties.

152. (Original) A dispensing assembly as claimed in claim 131, comprising at least two positive displacement pumps connected in parallel, one pump having a working

stroke displacing a volume at least about ten times larger than that of the other pump and in which the dimensions of the divider barrier and the main bore are such as to cause them to fit closely in the sample liquid reservoir and across and against the nozzle entrance under the influence of the system liquid.

153. (Original) A dispensing assembly as claimed in claim 131, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

154. (Original) A dispensing assembly for liquid droplets of less than 5 µl in volume comprising:-

a two part body forming a dispenser body, the two part body comprising an inner part and a nozzle mounting part housing respectively a system liquid reservoir and a sample liquid reservoir forming a main bore;

a divider barrier mounted between the inner part and the nozzle mounting part to separate the liquid reservoirs and comprising a body of elastomeric substantially incompressible material;

a nozzle mounted on the nozzle mounting part and terminating in a dispensing tip, the nozzle having a nozzle bore with a nozzle entrance communicating with the sample liquid reservoir of the main bore; and

at least two positive displacement pumps connected in parallel, one pump having a working stroke displacing a volume at least about ten times more than the volume displaced by the other pump.

155. (Original) A dispensing assembly as claimed in claim 154 comprising;

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

156. (Original) A dispensing assembly as claimed in claim 154 comprising;

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode below the tip; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

157. (Original) A dispensing assembly as claimed in claim 154 comprising:-

an electrode electrically coupled to the dispensing tip;

a separate receiving electrode remote from the tip ;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

a droplet receiving substrate mounted between the receiving electrode and the dispensing tip.

158. (Original) A dispensing assembly as claimed in claim 154 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip including a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted below the receiving electrode; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

159. (Original) A dispensing assembly as claimed in claim 154 comprising;

an electrode electrically coupled to the dispensing tip ;

a plurality of separate receiving electrodes remote from the tip each having a hole for the passage of a droplet therethrough;

a droplet receiving substrate mounted below the receiving electrodes;

means for activating the receiving electrodes separately; and

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween.

160. (Original) A dispensing assembly as claimed in claim 154 comprising;

an electrode electrically coupled to the dispensing tip ;

a separate receiving electrode remote from the tip;

a droplet receiving substrate mounted above the receiving electrode;

a high voltage generating means connected to at least one of the electrodes to provide an electrostatic field therebetween; and

synchronous indexing means for the dispenser and the receiving electrode for accurate deployment of droplets on the substrate.

161. (Original) A dispensing assembly as claimed in claim 154 comprising;

an electrode electrically coupled to the dispensing tip ;

a plurality of separate receiving electrodes forming droplet deflection electrodes remote from the tip;

a droplet receiving substrate mounted below the deflection electrodes;

a high voltage generating means connected to at least one of the deflection electrodes to provide an electrostatic field therebetween; and

control means to vary the voltage applied to the deflection electrodes.

162. (Original) A dispensing assembly as claimed in claim 154, comprising:-

a compression wave generator; and

a controller having means to actuate the generator to cause a wave in the sample liquid as the positive displacement pump displacing the smaller volume completes delivery of the sample liquid to the dispensing tip.

163. (Original) A dispensing assembly as claimed in claim 154, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause a compression wave in the sample liquid as the positive displacement pump placing the smaller volume completes delivery of the sample liquid to the dispensing tip.

164. (Original) A dispensing assembly as claimed in claim 154, comprising:-

a compression wave generator for causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to actuate the generator to cause a wave in the sample liquid as the positive displacement pump placing the smaller volume completes delivery of the sample liquid to the dispensing tip.

165. (Original) A dispensing assembly as claimed in claim 154, comprising:

a piezoactuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the piezoactuator to cause the compression wave in the sample liquid as the positive displacement pump displacing the smaller volume completes delivery of the sample liquid to the dispensing tip.

166. (Original) A dispensing assembly as claimed in claim 154, comprising:-

a magnetostrictive actuator for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the system liquid for transfer through the divider barrier and hence into the sample liquid; and

a controller having means to operate the magnetostrictive actuator to cause a compression wave in the sample liquid as the positive displacement pump displacing the smaller volume completes delivery of the sample liquid to the dispensing tip.

167. (Original) A dispensing assembly as claimed in claim 154 comprising a magnetostatic actuator including a magnetic core and a magnetic coil coupled together for causing a sudden compression of portion of the assembly carrying the system liquid and hence causing a compression wave to be generated in the

system liquid for transfer through the divider barrier and hence into the sample liquid and a controller having means to operate the magnetostatic actuator to cause a compression wave in the sample liquid as the positive displacement pump completes delivery of the sample liquid to the dispensing tip.

168. (Original) A dispensing assembly as claimed in claim 154, in which the dispenser body mounts a plurality of nozzles and the divider barrier additionally separates portion of the main bore adjacent each nozzle entrance to form separate sample liquid reservoirs divided from the one system liquid reservoir.

169. (Original) A dispensing assembly as claimed in claim 149, comprising a separate system liquid pressurising means for the rapid expulsion of sample liquid.

170. (Currently Amended) A ~~divider barrier~~ dispensing assembly as claimed in claim 154, in which the divider barrier comprises at least two closely contacting members, at least one member being secure to each of the parts.